REMARKS

The application has been reviewed in light of the Final Office Action dated December 23, 2009. Claims 1-10, 12-15, 17-30, and 32-33 are pending in this application, with claims 1, 30, and 32 being in independent form. By the present Amendment, claims 1, 30, and 32 have been amended. Claims 11, 16, and 31 have been previously canceled without prejudice or disclaimer. It is submitted that no new matter has been added and no new issues have been raised by the present Amendment.

Claims 1-10, 12-15, and 17-30 are rejected under 35 U.S.C. 112, second paragraph, as allegedly indefinite for failing to definitely establish what is trained by the training system, the medical claim or the trained classifiers. To avoid any possibility of confusion, and purely for the purposes of advancing prosecution, the language of the claims has been amended hereby and it is respectfully requested that the rejection be withdrawn.

Claims 1-10, 12-15, 17-29, and 32-33 have been rejected under 35 U.S.C. 101 as allegedly directed towards non-statutory subject matter as process claims must be tied to a particular machine. Again, purely for the purposes of advancing prosecution, this language has been changed and it is respectfully requested that the rejection be withdrawn.

Claims 1-4, 8-10, 12-25, 30, and 32 were rejected under 35 U.S.C. 103(a) as allegedly unpatentable over U.S. Patent No. 4,491,725 ("Pritchard") in view of U.S. Patent No. 6,917,926 ("Chen"). Claim 33 was rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Pritchard in view of Chen and U.S. Patent No. 5,613,072 ("Hammond"). Claims 5-7 were rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Pritchard in view of Chen and Applicants allegedly admitted prior art. Claims 26-29 were rejected under 35 U.S.C. 103(a) as

allegedly unpatentable over Pritchard in view of Chen and U.S. Patent Application Publication No. 2003/0149594 ("Beazley").

Applicants have carefully considered the Examiner's comments and the cited art, and respectfully submit independent claims 1, 30, and 32 are patentably distinct from the cited art, for at least the following reasons.

In independent claims 1 and 30, a medical claim is automatically classified to predict a disposition of the claim by a target payer. This may be, for example, determining whether the particular target payer would likely accept or reject the claim in its current form. This is a valuable analysis because rejected claims may be difficult to rectify after submission. Known approaches for predicting the disposition of a claim generally utilize a rules-based approach in which the substance of the claims are checked against predetermined rules governing such things as syntax. Pritchard is an example of the prior art approach. In Pritchard, claims are transmitted to a central broker computer where the claim is examined to determine if it has been correctly prepared. This examination includes checking for errors and determining if requirements have been met. It is inherent in this approach that rules regarding what constitutes an error and what constitutes satisfaction of requirements are pre-known. Accordingly, Pritchard clearly employs a rules-based approach.

Use of a rules-based approach is indeed rather intuitive as the target payers themselves tend to use rules-based approaches to determine whether to pay or deny a claim and thus theoretically, if the rules used to pre-check the claim prior to submission to the target payer are identical to the rules used by the target payer to pay or deny a claim, then the use of a rules-based approach would be simple and accurate in predicting the disposition of the claim.

However, embodiments of the present invention have adopted a new approach to looking at medical claims processing. According to this approach, the rules of medical claims payers may be seen as difficult to understand, frequently changing and inconsistent in application. Accordingly, embodiments of the present invention seek an alternative to the standard rules-based approaches to predicting disposition of a claim, such as is seen in Pritchard.

Thus the claims employ machine learning techniques to automatically classify medical claims using a set of one or more trained classifiers and to thus predict the disposition of the claim based on the machine-learning classification.

There are of course known examples of machine learning. For example, Chen relates generally to an example of machine learning. Chen, however, does not teach or suggest that machine learning may be applied to predicting the disposition of medical claims.

Accordingly, Pritchard relates to determining the disposition of claims using conventional rules-based approaches but fails to suggest that machine learning may be used to make this determination as to disposition while Chen relates to the use of machine learning but fails to suggest that machine learning may be applied to determining the disposition of claims. The Office Action thereby bases the rejection of the claims on the assumption that the determination as to disposition of claims of Pritchard could be combined with the machine learning aspects of Chen by one or ordinary skill in the art. This conclusion, however, is misguided.

As indicated above, it is intuitive that a rules-based approach be used to determine the disposition of claims because the target payers themselves use rules-based approaches to determine whether to pay or deny the claims. Using machine learning in this context would thus be counterintuitive and the existing art such as Pritchard can therefore be seen as teaching away

from the combination. Not surprisingly, machine learning techniques are generally used to solve problems for which a set of rules could not be created. For example, Chen uses machine learning approaches to predict patients that will have significant neonatal problems or to predict which members of a population will need transplants or develop serious disabilities. Because questions such as these are not solvable in the general-case (i.e. a deterministic solution is not possible), these questions lend themselves to statistical approaches such as machine learning (where probabilistic solutions are employed).

The fact that target payers themselves vet claims using sets of rules means that predicting the disposition of claims are intuitively performed by rules-based approaches. Similarly, the fact that machine learning techniques are computationally expensive and inherently probabilistic and not deterministic means that one would not ordinarily apply machine learning techniques to predicting the disposition of medical claims. Thus Pritchard teaches away from Chen and Chen teaches away from Pritchard.

The independent claims take an innovative leap in applying machine learning techniques to the question of predicting disposition of claims. Such a leap would not be obvious to one of ordinary skill in the art. The innovation of these claims may focus on the observation that even though disposition of claims by payers is based on theoretically knowable rules, these rules so frequently change or are so inconsistently applied that the probabilistic approach of machine learning may be preferable to the deterministic approach of rules-based classification. As this observation is nowhere mentioned in the cited art, one of ordinary skill in the art would not be motivated to combine the teachings of Pritchard with those of Chen.

It should also be noted that Pritchard and Chen are not related fields of endeavor as Pritchard relates to the processing of medical billing claims and Chen relates to using machine learning techniques to determine if patients are likely to have catastrophic diseases that may be expensive to treat and thus result in expensive medial claims. These issues are thus not analogous even though they both mention medical claims.

Accordingly, for at least the remarks discussed above, independent claims 1 and 30 are patentably distinct from the cited art at least because the cited art fails to teach or suggest, "automatically classifying the medical claim using a set of one or more trained classifiers, wherein each of the classifiers is trained by a training system using one or more machine learning techniques to predict a disposition of the claim by the target payer using training data that includes previously submitted claims and corresponding outcomes" as claimed.
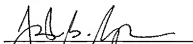
Similarly, independent claim 32 is patentably distinct from the cited art at least because the cited art fails to teach or suggest, "automatically predicting an expected cash flow for each medical claim, or a subset of the medical claims, using a set of one or more trained classifiers that are trained by a training system using one or more machine learning techniques to predict a disposition of the medical claims by the one or more target payers using training data that includes previously submitted claims and corresponding outcomes" as claimed.

Dependent claims 2-10, 12-15, and 17-29 are patentably distinct from the cited art at least owing to their dependence upon independent claim 1, dependent claim 33 is patentably distinct from the cited art at least owing to its dependence upon independent claim 31.

Favorable reconsideration is earnestly solicited.

Respectfully submitted,

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